

YAMAHA K-31

Natural Sound Stereo, Double Cassette Deck

Dolby B-C Noise Reduction*

Built-in Multiplex Filter

Music Search, Rec Return

Normal/High Speed Dubbing with Synchro Start

Relay Play

Thank you for purchasing the YAMAHA K-31 stereo cassette deck.

CENTER

OWNER'S MANUAL



TABLE OF CONTENTS

Safety Instructions	1
Caution	2
Front Panel Parts and Function	3
Connections	5
Cassette Tapes	5
Recording and Playback	6
Maintenance	8
Specifications	8
Troubleshooting	9

IMPORTANT

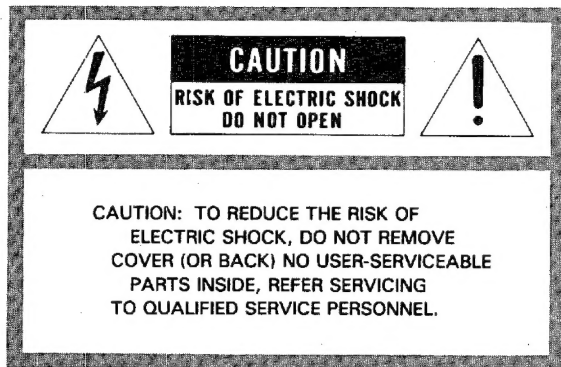
Please record the serial number of your unit in the space below.

Model: K-31

Serial No. _____

The serial number is located on the rear of the unit.

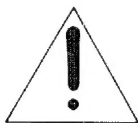
Retain this Owner's Manual in a safe place for future reference.



• Explanation of Graphical Symbols



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING

To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

SAFETY INSTRUCTIONS

1 Read Instructions — All the safety and operating instructions should be read before the appliance is operated.

2 Retain Instructions — The safety and operating instructions should be retained for future reference.

3 Heed Warnings — All warnings on the appliance and in the operating instructions should be adhered to.

4 Follow Instructions — All operating and other instructions should be followed.

5 Water and Moisture — The appliance should not be used near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near swimming pool, etc.

6 Carts and Stands — The appliance should be used only with a cart or stand that is recommended by the manufacturer.

7 Wall or Ceiling Mounting — The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.

8 Ventilation — The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug or similar surface that may block the ventilation openings; or placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

9 Heat — The appliance should be situated away from heat sources such as radiators, stoves, or other appliances that produce heat.

10 Power Sources — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

11 Power-Cord Protection — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying receptacles, and the point where they exit from the appliance.

12 Cleaning — The appliance should be cleaned only as recommended by the manufacturer.

13 Nonuse Periods — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

14 Object and Liquid Entry — Care should be taken so that objects do not fall into and liquids not spilled into the inside of the appliance.

15 Damage Requiring Service — The appliance should be serviced by qualified service personnel when:

- A. The power-supply cord or the plug has been damaged; or
- B. Objects have fallen, or liquid has been spilled into the appliance; or
- C. The appliance has been exposed to rain; or
- D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
- E. The appliance has been dropped, or the cabinet damaged.

16 Servicing — The user should not attempt to service the appliance beyond those means described in the operating instructions. All other servicing should be referred to qualified service personnel.

**CAUTION: READ THIS BEFORE
OPERATING YOUR UNIT.**

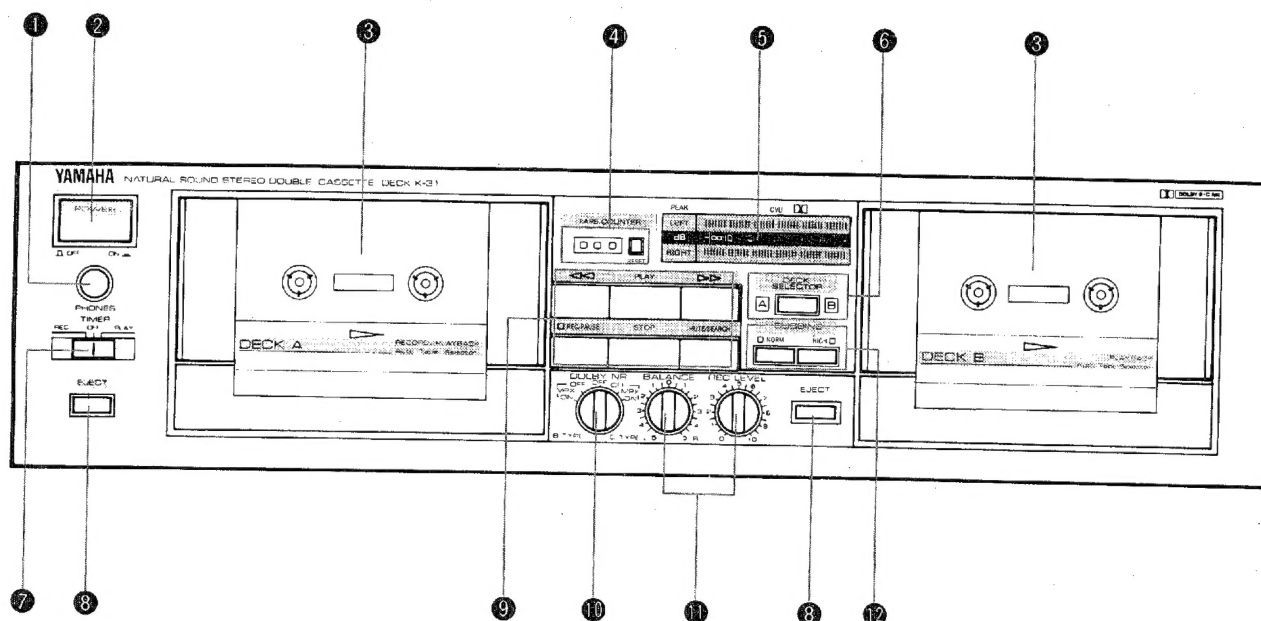
- 1** This unit is a sophisticated stereo cassette deck. To ensure proper operation for the best possible performance, please read this manual carefully.
- 2** Choose the installation of your unit carefully. Avoid placing it in direct sunlight or close to source of heat. Also avoid locations subject to vibration and excessive dust, heat, cold or moisture. Keep it away from such sources of hum as transformers or motors.
- 3** Do not open the cabinet as this may result in damage to the deck or electrical shock. If a foreign object should get into the deck, contact your local dealer.
- 4** When removing the power plug from the wall outlet, always pull directly on the plug; never pull the cord itself.
- 5** Do not use force when operating switches and knobs.
- 6** When moving the deck, be sure to first pull out the power plug and remove all cords connecting the deck to other equipment.
- 7** Do not attempt to clean this unit with chemical solvents as this may damage the finish. Use a clean, dry cloth.
- 8** Never allow metallic items (e.g. screwdrivers, tools, etc.) to come near the record/playback head assembly. Doing so may not only scratch or damage the head's mirror-smooth finish, it may change the magnetic characteristics of the heads, causing a deterioration in reproduction performance quality.

9 Although the record/playback head used in this unit is a high quality permalloy head with outstanding reproduction characteristics, it can become dirty through the use of old tapes or from dust accumulation over time. This can have a serious effect on reproduction quality. Clean the heads regularly with one of the commonly available head cleaners or with cleaning solutions as explained later in this manual.

10 Be sure to read the "Troubleshooting" section of this manual for advice on common operating errors before concluding that your unit is faulty.

11 Keep this manual in a safe place for future reference.

FRONT PANEL PARTS AND FUNCTION



① PHONES jack

Connect a set of headphones to this jack for monitoring recording or playback.

② POWER switch

Press this switch to turn the power on. Press again to turn the power off.

③ Cassette compartments

④ TAPE COUNTER and RESET button

Before recording a tape, press the RESET button to set the TAPE COUNTER to "000". This allows you to index the selections.

⑤ PEAK level meters

Indicate the peak of the signal level during recording and playback over a range from $-\infty$ dB to +6 dB.

⑥ DECK SELECTOR and indicators

Press this button to select the mode of the operation buttons. When A indicator located at the left of the button is lit, the operation buttons function for DECK A. When B indicator located at the right of the button is lit, the operation buttons function for DECK B.

⑦ TIMER switch

With a commercially available audio timer, set this switch to REC for timer recording, and to PLAY to timer playback. When the timer is not used, be sure to set this switch to OFF.

⑧ EJECT buttons

To load a cassette tape, press the EJECT button and the cassette compartment will open. Depress the cassette compartment to close it.

9 Operation buttons

First, select the deck to be operated, with the DECK SELECTOR, then operate the following buttons.

<<: Press this button to rapidly rewind the tape. To release the rewind mode, press the STOP button.

PLAY: Press for playback. It is also necessary to use this button to engage the Record mode.

>>: Press this button to rapidly advance the tape. To release the fast forward mode, press the STOP button.

REC/PAUSE and indicator: This button functions only for DECK A. Pressing this button sets the DECK A to Rec Standby mode, and the indicator lights up. While in this mode the PEAK level meters will function allowing you to monitor the recording signal level of your program source. (Refer to the "SETTING RECORDING LEVEL" section of this manual.) To initiate recording from the Rec Standby mode, press the PLAY button. Pressing the REC/PAUSE button during actual recording engages the Rec Pause mode. To resume recording, press the PLAY button.

STOP: Press this button to stop the tape while in any mode.

MUTE/SEARCH:

Mute operation (DECK A only): When the MUTE/SEARCH button is pressed at any time during recording, a 4-second blank interval is automatically recorded on the tape. Then, the Rec Pause mode is engaged automatically.

In order to record a blank interval longer than 4 seconds,

press the MUTE/SEARCH button and hold it in for the desired length of time. After the button is released, the 4-second blank interval will also be recorded automatically, then the Rec Pause mode is engaged automatically.

To resume recording, press the PLAY button.

Search operation: By pushing either the >> or << button simultaneously with this button, the tape will be advanced to the beginning of the selection either before or after the one being listened to, from which point play will be resumed.

10 DOLBY NR selector

OFF:

Set to this position if no noise reduction is desired. In the OFF position, signals do not pass through the noise reduction circuits and are output unprocessed.

B and C TYPE:

When playing tapes encoded with Dolby NR or making recordings (of sources except FM. If FM, see MPX ON and OFF) to be encoded with Dolby NR, set the selector to the desired type of Dolby noise reduction; B or C TYPE MPX OFF.

- Dolby noise reduction is an extremely effective method of reducing undesirable background hiss on tapes. This unit incorporates both Dolby B NR and the newer Dolby C NR systems. Dolby C NR is approximately twice as effective as Dolby B NR.
- When playing back any tape (even a recording of an FM broadcast) encoded with Dolby B or Dolby C, set the selector to the B TYPE MPX OFF or C TYPE MPX OFF, respectively.
- Dolby and the double D mark are trademarks of Dolby Laboratories Licensing Corp. Dolby noise reduction system manufactured under license from Dolby Laboratories Licensing Corp.

MPX filter ON and OFF:

When recording from FM stations, set the selector to the Dolby NR desired and also set it to the B or C TYPE MPX ON position. However, when not recording FM broadcasts but using Dolby NR, set the selector to the B or C TYPE MPX OFF position.

- FM stations transmit a 19 kHz pilot signal in addition to the broadcast program. Sometimes this pilot signal may leak into the audio output depending on the tuner and broadcast conditions. Since the 19 kHz pilot signal is undesirable, activating the MPX filter will effectively filter out the signal.

11 REC LEVEL controls (DECK A only)

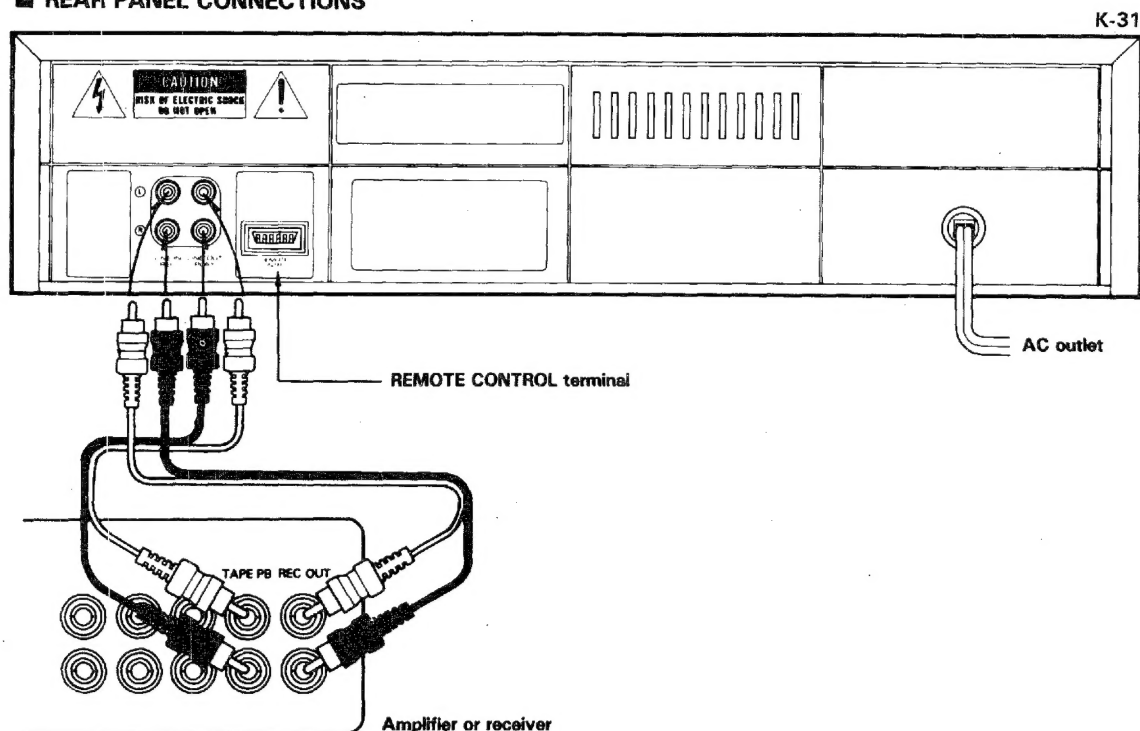
Used to adjust the input level of the signal coming from the rear panel LINE IN/REC jacks for recording, and the adjustable signal level is displayed on the PEAK level meters.

12 DUBBING buttons and indicators

Press this button to dub the tape from DECK B to DECK A. For high speed dubbing, press the HIGH button. For high quality dubbing, press the NORM button. The corresponding indicator lights up.

CONNECTIONS

REAR PANEL CONNECTIONS



The White plug on the paired connecting cables corresponds to the Left channel and the Red plug corresponds to the Right channel. The LINE OUT/PLAY jacks on the K-31 should be connected to the Tape PB (Playback/Input) jacks on your amplifier, and the LINE IN/REC jacks on the K-31 should be connected to the Rec Out (Rec/Output) jacks on your amplifier. Make sure that the left and right channel connections are properly made, and that the plugs are inserted firmly. Connect the power cord to an AC outlet or to the AC

outlet provided on the rear panel of your receiver, integrated amplifier, or control amplifier, etc. Make sure that power to both the K-31 and your amplifier (receiver, etc.) are turned off before making connections. With the REMOTE CONTROL terminal on the rear of the K-31, system remote control through the amplifier is possible. Connect the terminal to the amplifier with the flat cable supplied to the amplifier. For details of A-29, A-31, operation, refer to the Owner's Manual of the amplifier (AV-33, AV-35).

CASSETTE TAPES

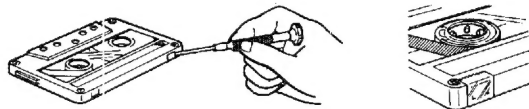
CASSETTE TAPES

There are many different types of cassette tapes available, however, they all conform to standard specifications so any brand may be used with the K-31.

- **Classification of Cassettes Tapes by Formulation**
Cassette tapes are available in four basic types depending on their formulation, or type of magnetic material and manufacturing process. These four types are commonly known as Normal (I/NORM), Chrome (II/CrO₂), Ferrichrome (III/FeCr), and Metal (IV/Metal), and they each require specific bias, level, and equalization settings for optimum performance. The K-31 has an Auto Tape Selector which automatically adjusts for the proper bias, level and equalization according to the tape formulation - all you have to do is load a cassette and the Auto Tape Selector does the rest.
- Old-type Metal tape cassette shells do not have the necessary hole for Auto Tape Selector operation. It is recommended that you do not record with this kind of Metal cassette. However, Metal tape cassettes recorded on another deck may be played back with the K-31 at the Chrome (II/CrO₂) settings. All current cassette tapes will have this small opening in the cassette shell, so be sure you use suitable cassettes with the K-31.
- The K-31 does not have the required setting for Ferrichrome (III/FeCr) tape, since this tape formulation is not widely used. Should you use a Ferrichrome tape, it will be recorded and played back at the Normal (I/NORM) settings. And this will result in an unnatural high frequency emphasis. This effect may be compensated for somewhat by adjusting the tone controls of your amplifier.
- YAMAHA does not recommend the use of C-120 cassettes since the extreme thinness of the tape makes them susceptible to mechanical and electrical problems.

RECORDING AND PLAYBACK

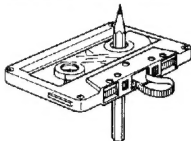
■ PROTECTING YOUR RECORDINGS



All cassette tapes are provided with erasure protection holes to prevent recorded tapes from being accidentally erased. There is a small tab covering the hole on each cassette, and it should be broken off with the screwdriver after recording a tape. Without this tab covering the hole, it is impossible to record on that tape again; thus, you can keep any recorded tape for as long as you wish without fear of accidental erasure. Should you wish to use a cassette tape protected in this way for later recording, simply covering the hole with adhesive tape will permit erasure and re-recording.

- When using Chrome (II/CrO₂), or Metal tape, make sure you do not cover the hole intended for the tape formulation check.

■ TAKING UP SLACK IN THE TAPE



Slack in the tape inside of the cassette shell can be corrected by simply inserting a pencil into one of the spools and winding it until all the slack is taken up.

■ STORAGE OF YOUR CASSETTE

After putting a cassette tape back into its case, store in a location away from exposure to direct sunlight, humidity, high temperatures, and magnetic fields (away from television sets, speakers, etc.). High temperatures and humidity will damage the tape itself, while exposure to magnetic fields may cause a loss of recorded material.

■ SETTING RECORDING LEVEL

In order to make recordings with the best possible signal-to-noise ratio, it is important to set the recording level at the highest level possible without introducing distortion. Push the REC/PAUSE button to engage the Rec Standby mode, and play a section of the program to be recorded. Watch the PEAK level meters and adjust the REC LEVEL controls so that the average meter reading is between -5 dB and +3 dB, with occasional peaks no higher than +6 dB.

■ RECORDING (DECK A only)

1. Make sure that the TIMER switch is set to the OFF position, then turn on the POWER switch.
 2. Press the DECK SELECTOR so that A indicator lights up.
 3. Open the cassette compartment by pressing the EJECT button and load a cassette tape in DECK A with the exposed tape face down.
 4. Select DOLBY B or C NR with DOLBY NR selector.
 5. Press the REC/PAUSE button to engage the Rec Standby mode.
 6. Play the program source to be recorded, and adjust the recording level using the REC LEVEL controls.
 7. Press the PLAY button to start recording.
 8. To temporarily stop the recording, press the REC/PAUSE button. To resume recording, press the PLAY button again.
 9. To stop recording, press the STOP button.
 10. When MUTE/SEARCH button is pressed during recording, a 4-second blank interval is automatically recorded on the tape, then the Rec Pause mode is engaged.
- When the << button is pressed during recording, the tape is automatically rewound to the point at which the recording has been started.

■ DUBBING (DECK B to DECK A)

1. Make sure that the TIMER switch is set to the OFF position, then turn on the POWER switch.
2. Open the cassette compartments by pressing the EJECT buttons and load a recorded cassette tape in DECK B and blank cassette tape in DECK A.
3. Press the NORMAL or HIGH DUBBING button according to the desired dubbing speed. Dubbing starts automatically.
4. To stop dubbing, press STOP button.

When DECK SELECTOR is set to A, DECK A and DECK B stops at the same time.

When the DECK SELECTOR is set to B, DECK B stops and DECK A stops after providing a blank section of about 4 seconds.

- * During dubbing, the Dolby NR is automatically set to OFF and the recorded tape can be dubbed as it is. (When the tape to be dubbed is recorded with Dolby NR, the Dolby NR effect is also dubbed.)
When the tape recorded with Dolby NR is dubbed, the output sound is played back without Dolby NR.

NOTE:

Please check the laws on copyright in your country to record from records, discs, tapes, radio, etc. Recording the prerecorded tapes or other published or broadcast material may infringe copyright laws.

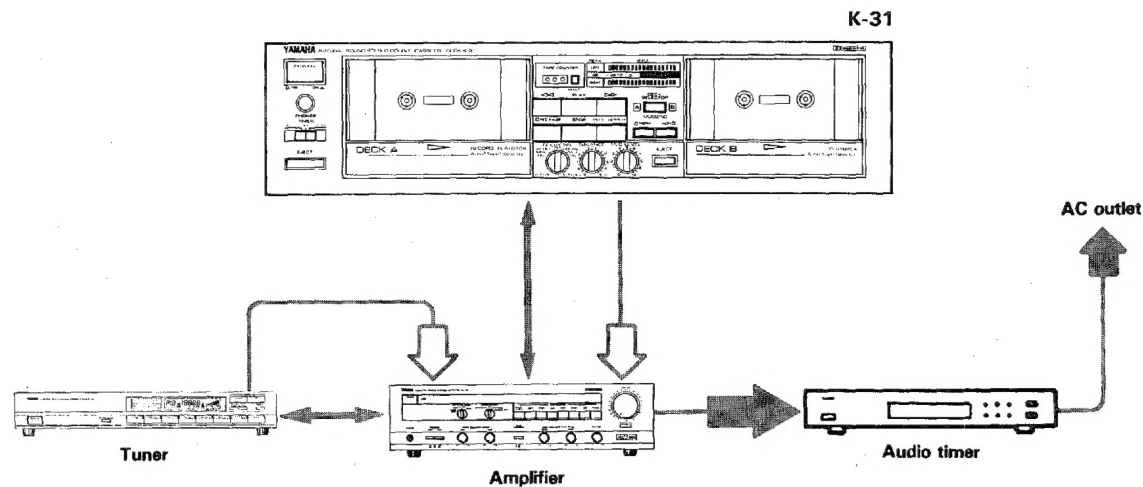
■ PLAYBACK

1. Make sure that the TIMER switch is set to the OFF position, then turn on the POWER switch.
2. Open the cassette compartment by pressing the EJECT button and load a recorded cassette tape.
3. Select the deck to be operated, with DECK SELECTOR.
4. For tapes recorded with Dolby NR system, set the DOLBY NR selector.
5. Press the PLAY button to start playback.
6. To stop playback, press the STOP button.

■ RELAY PLAY

1. Make sure that the TIMER switch is set to the OFF position, then turn on the POWER switch.
 2. Open the cassette compartments by pressing the EJECT buttons and load a cassette tape to be played in DECK A and a cassette to be played next in DECK B.
 3. Press the DECK SELECTOR so that A indicator lights up.
 4. Press the PLAY button to start relay play. When cassette loaded in DECK A reaches its end, DECK A automatically stops and DECK B starts playing.
 5. To stop relay play, press the STOP button.
- * For tapes recorded with Dolby NR system, set the DOLBY NR selector.

■ TIMER RECORDING/PLAYBACK



When using the TIMER switch in combination with a commercially available audio timer, it is possible to make recordings and initiate playback at any time automatically by presetting the deck in advance.

• Timer Recording (DECK A only)

1. Make sure that all power cord connections between the timer and amplifier are properly made. No change in any of the other connections between deck and amplifier, etc., is necessary.

MAINTENANCE

- After turning on the power to each component, select the station on your tuner which you want to record and turn down the volume on your amplifier. This will have no effect on the recording signal level. Remember to set the proper recording level.
- Set the timer to the desired times. It is advisable to set the timer to begin recording slightly before the actual recording time, and end slightly after the actual recording time, so that you leave some room for later editing.
- Set the TIMER switch to the REC position.
- The timer will send power to the amplifier, tuner and deck at the preset time, turning all the components on and initiating the recording mode.

CAUTION:

If the tape cannot be ejected after timer recording, set the TIMER switch to OFF and the K-31's POWER switch to ON; the tape can then be ejected.

• Timer Playback

- All connections are the same as for timer recording.
 - Turn on the amplifier and adjust the volume and Tone controls.
 - Set the input mode selector of your amplifier to the Tape mode.
 - Set the timer to the time you wish to start and stop playback.
 - Set the TIMER switch to the PLAY position.
 - At the preset time, the timer will turn power on to the amplifier and tape deck and begin playback. It will shut power OFF, at the preset time as well ending playback.
- When cassettes are loaded in both DECK A and DECK B, the unit enters the relay play mode and DECK A starts playback first.

After using your K-31 for a certain length of time, it is possible that the sound of your tapes may deteriorate with fading, vibration, or noise as a noticeable result. This is caused by an accumulation of dirt or dust on the heads, capstan, or pinch roller, and magnetization of the heads. It is advisable to clean the capstan and pinch roller. Use a commonly available cotton swab and head cleaning solution to do this, or use a special head cleaning tape. Head demagnetizers are also commonly available.

- When cleaning the heads, be careful not to apply unnecessary pressure.
- When demagnetizing the heads, be sure to follow the instructions of the head demagnetizer carefully.
- For better access to the head assembly, the cassette compartment cover is detachable by pulling upward. To reattach it, reverse the same procedure.

SPECIFICATIONS

Track Configuration 4 track, 2 channel recording and playback stereo cassette tape deck

Motor DC servo motor x 2

Heads

Rec/play head Hard Permalloy x 2

Erase head Double Gap Ferrite

Wow and Flutter

W. RMS No more than 0.08%

W. Peak No more than $\pm 0.15\%$

Fast Winding Time About 100 seconds (C-60)

Signal-to-Noise Ratio

(Dolby off) More than 58 dB

(Dolby B on) More than 66 dB

(Dolby C on) More than 74 dB

Frequency Response (-20 dB)

Normal Tape 20 — 16,000 Hz, ± 3 dB

CrO₂ Tape 20 — 17,000 Hz, ± 3 dB

Metal Tape 20 — 18,000 Hz, ± 3 dB

Harmonic Distortion No more than 1.0%

Channel Separation More than 40 dB

Crosstalk More than 55 dB

Input Sensitivity

Line 50 mV/50 k-ohms

Output Reference level/Load impedance

Line 360 mV/1.2 k-ohms

Phones 0.3 mW/8 ohms

Power Requirements AC 120V, 60 Hz

Power Consumption 18W

Dimensions (W x H x D) 435 x 112 x 271.5 mm
(17-1/8" x 4-3/8" x 10-11/16")

Weight 4.5 kg (9 lbs. 15 oz.)

Specifications subject to change without notice.

TROUBLESHOOTING

When your cassette deck fails to function properly, before assuming it is faulty, check it according to the following troubleshooting list. It details the corrective action you can take yourself without having to call a service engineer. If you have any doubts or questions, get in touch with your nearest Yamaha dealer.

Symptom	Cause	Remedy
Tape doesn't move in recording or playback.	<ul style="list-style-type: none"> Power plug not properly plugged in. DECK SELECTOR not properly set. 	<ul style="list-style-type: none"> Reinsert plug properly. Set the DECK SELECTOR correctly.
REC/PAUSE button fails to function.	<ul style="list-style-type: none"> No cassette tape loaded. Protective tab broken off. 	<ul style="list-style-type: none"> Load a cassette tape. Change to different tape, or cover the hole remaining after removal of tab with adhesive tape.
Sounds become faint and sometimes inaudible.	<ul style="list-style-type: none"> Heads are dirty. Heads are magnetized. Worn out or poor quality tape. 	<ul style="list-style-type: none"> Clean head using cleaning tape. Demagnetize head using head demagnetizer. Change to different tape.
Playback sounds are poorly balance.	<ul style="list-style-type: none"> DOLBY NR selector not properly set. 	<ul style="list-style-type: none"> Playback in the position in which was recorded.
Recorded sounds are distorted.	<ul style="list-style-type: none"> Recording level is too high. 	<ul style="list-style-type: none"> Check input level with meter and use lower recording level when recording.
Excessive noise.	<ul style="list-style-type: none"> Heads are dirty. Heads are magnetized. Worn out or poor quality tape. Connection(s) improperly made. Affected by external electrical noise. 	<ul style="list-style-type: none"> Clean head. Demagnetize head with head demagnetizer. Change to better tape. Check input and output connections and reinsert properly. Move away from electrical appliances (TV, fluorescent light, electric blanket, etc.)
Excessive wow (wavering of the sound).	<ul style="list-style-type: none"> Dirty capstan, pinch roller, etc. or poor tape. Tape is unevenly wound. 	<ul style="list-style-type: none"> Clean capstan, pinch roller, or change to better tape. Rewind tape.
Fails to record.	<ul style="list-style-type: none"> REC LEVEL controls too low. Protective tabs broken off. 	<ul style="list-style-type: none"> Adjust REC LEVEL controls. Change tape or cover protective hole with adhesive tape.

THE
FEDERAL
BUREAU OF
INVESTIGATION

YAMAHA
HAMAMATSU, JAPAN

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